

HW Review:

• Radium-228 <sup>← mass number</sup>  $^{228}_{88}\text{Ra}^{2+}$

- atomic #: 88

- #  $p^+$ : 88

- #  $n^0$ : 140

- mass #: 228

- #  $e^-$ : 86

- charge: 2+

• Barium-137  $^{137}_{56}\text{Ba}^{1+}$

- atomic #: 56

- #  $p^+$ : 56

- #  $n^0$ : 81

- mass #: 137

- #  $e^-$ : 55

• Sulfur-32  $^{32}_{16}\text{S}^{2-}$

- atomic #: 16

- #  $p^+$ : 16

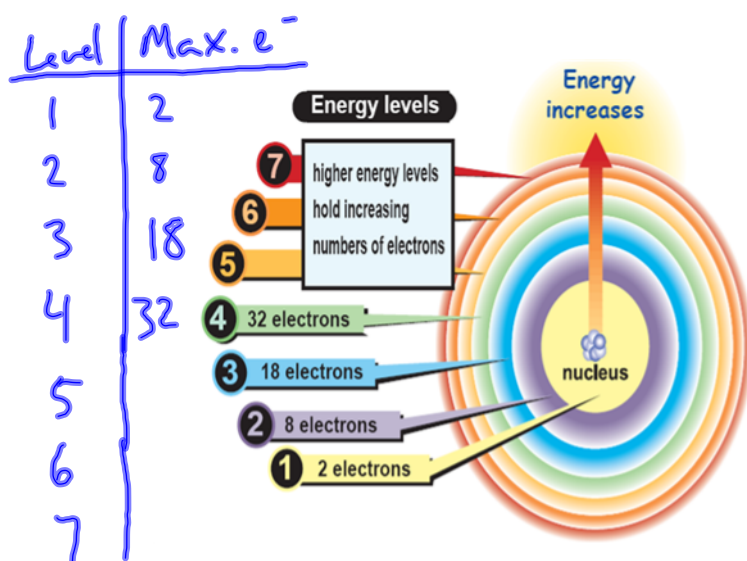
- #  $n^0$ : 16

- #  $e^-$ : 18

- charge: 2-

# Electron Arrangement

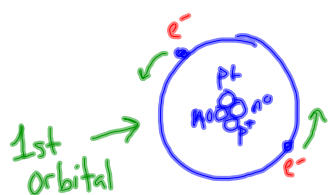
- Energy levels
  - Close to the nucleus, electrons have low energy
  - Far away from the nucleus, electrons have high energy
  - Each level has a maximum amount of electrons it can hold



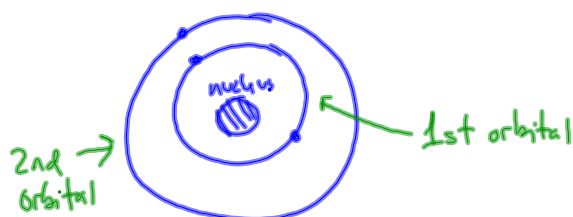
- Rule: Electrons must occupy the lowest energy level first.

# Bohr Diagrams

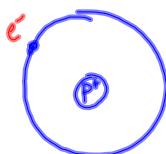
- Model developed by Niels Bohr
- Diagrams show energy levels of an atom
- Show every electron orbiting the nucleus
- Example: Helium-4  ${}^4_2\text{He}$   
(neutral)



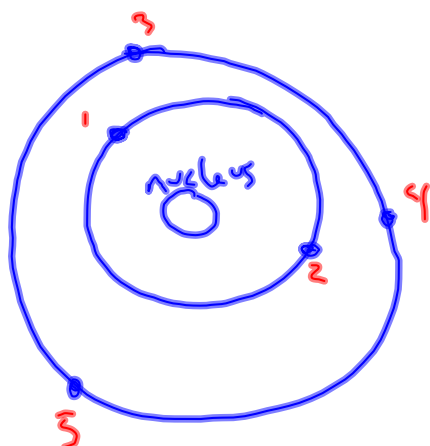
Lithium-6  ${}^6_3\text{Li}$   
(neutral atom)



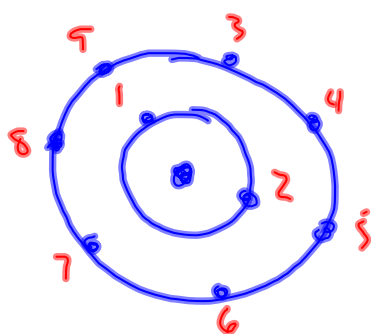
${}^1_1\text{H}$



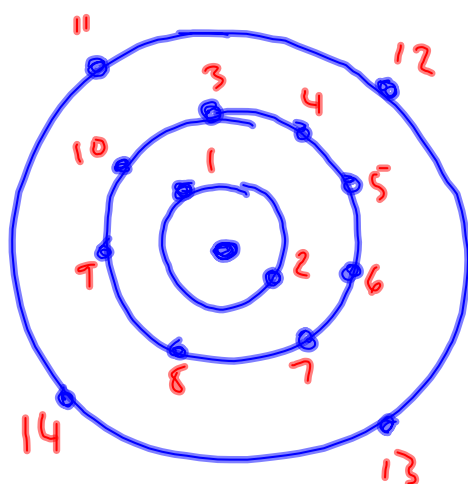
$^{10}_5\text{B}^\circ$  Boron-10



$^{19}_9\text{F}^\circ$  Fluorine-19



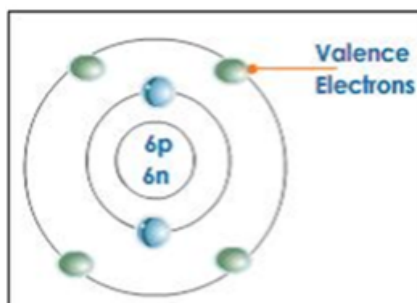
$^{28}_{14}\text{Si}^\circ$  Silicon-28





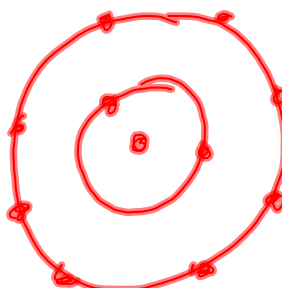
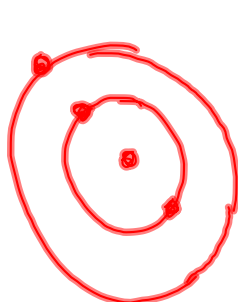
- Definition: electrons in the outermost energy orbital of an atom
- \* - Determines the properties of the element

Carbon-12

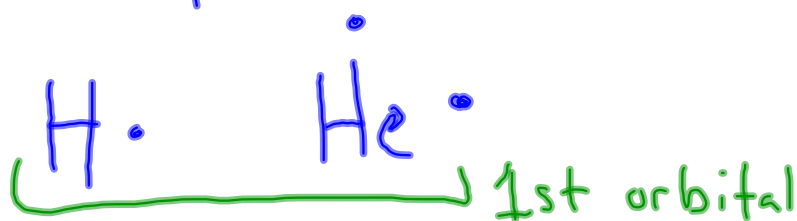


4 valence  $e^-$

(1)	Number of valence electrons in parentheses																(8)
H 1																	He 2
Li 3	Be 4	Transition metals: groups 3-12 (Variable number of valence electrons)										B 5	C 6	N 7	O 8	F 9	Ne 10
Na 11	Mg 12											Al 13	Si 14	P 15	S 16	Cl 17	Ar 18
K 19	Ca 20	Sc 21	Ti 22	V 23	Cr 24	Mn 25	Fe 26	Co 27	Ni 28	Cu 29	Zn 30	Ga 31	Ge 32	As 33	Se 34	Br 35	Kr 36
Rb 37	Sr 38	Y 39	Zr 40	Nb 41	Mo 42	Tc 43	Ru 44	Rh 45	Pd 46	Ag 47	Cd 48	In 49	Sn 50	Sb 51	Te 52	I 53	Xe 54



- Lewis Dot Diagram
  - Use symbol of the element and put dots around symbol to represent the valence electrons



- Dots start on right hand side of symbol
- Go counterclockwise to add dots

